IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	J.S. Rhodes Jr. et al.	Attorney Docket No.: PCCR122524
Application No.:	10/801903	Art Unit: 2123 / Confirmation No.: 3403
Filed:	March 16, 2004	Examiner: N. Janakiraman
Title:	SYSTEM AND METHOD FOR AUTOMATING THE GENERATION OF MANUFACTURING FRAME DESIGNS	

RESPONSE AFTER FINAL REJECTION

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February 12, 2009

TO THE COMMISSIONER FOR PATENTS:

This communication is in response to the November 10, 2008, Office Action ("Office Action"). The Office Action rejected Claims 1-8, 10, 13, 15-24, 26, and 33-38 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5729463, issued to Koenig et al. ("Koenig"), in view of U.S. Patent No. 6487524, issued to Hall et al. ("Hall"), further in view of "Formalizing the Design, Evaluation, and Application of Interaction Techniques for Immersive Visual Environments" ("Bowman"). Claims 11, 12, 14, 28-30, 41, and 42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Koenig, Hall, Bowman, and in further view of U.S. Patent No. 6453209, issued to Hill et al. ("Hill").

For the reasons set forth below, applicants respectfully traverse the rejections and request reconsideration and allowance of the pending claims.

Claim 1

Claim 1 recites the following:

1.   A method for generating frame designs for manufacturing a vehicle, the method comprising:

obtaining a specification for a plurality of components to be mounted on a frame of a vehicle;

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obtaining processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate a component on the frame, a range of additional positions to locate the component, and three-dimensional data corresponding to a tessellated representation of the component;

for each component of the plurality of components:

selecting the logical starting position as the current position for the selected component; and

repeatedly:

determining whether the selected component at the current position coincides with a hole in the frame through which the selected component may be attached to the frame, and whether the tessellated representation of the selected component located at a current position interferes with the tessellated representation of any other component previously configured to the frame; and

selecting a next position in the range of additional positions if the selected component does not coincide with a hole through which the selected component may be attached to the frame, or if the tessellated representation of the selected component located at a current position interferes with the tessellated representation of any other component already configured to the frame;

until the current position coincides with a hole in the frame through which the selected component may be attached to the frame and the tessellated representation of the selected component located at a current position does not interfere with the tessellated representation of any other component already configured to the frame;

configuring the selected component to the frame at the position corresponding to a matching hole; and

generating a frame design corresponding to the configured positions for each of the plurality of components.

Applicants note that the Office Action relies on Koenig for allegedly disclosing claim elements involving the design of a vehicle body using tessellated representations of components and location information. On the other hand, the Office Action relies on Hall for allegedly

disclosing claim elements for locating vehicle systems such that sufficient dimensional space or clearance is provided.

Claim 1 recites elements for automating the configuration of the location of components on a vehicle frame. In this regard, processing data is obtained that includes a logical starting position to locate a component and a range of additional locations to locate the component. If conflicts exist, multiple attempts to locate a component on a vehicle frame are performed within the range of locations in the obtained processing data. By allowing all components to be selected and iteratively attempting to locate and relocate each component on the frame, computer systems are provided in which design engineers are not required to configure the components for integration on a vehicle frame. In particular, the "specification for the plurality of components" may be obtained from users that do not have a technical background such as users at a car dealership. On the other hand, Koenig is directed to computer systems for designing and producing a lightweight automobile or vehicle body. In this regard, design engineers identify structural performance targets for the vehicle being designed. Then, a shell model of the vehicle is created and analyzed with design engineers selecting vehicle body components. Once the components have been selected, a structural analysis of the vehicle body is conducted to determine whether the shell model meets the structural performance targets established by a user. To facilitate development of the vehicle body, a crash model is created and analyzed until satisfactory crash requirements are satisfied.

Applicants submit that Koenig, Hall, and Bowman fail to disclose, either singularly or in combination, all of the elements recited above in Claim 1. In particular, Koenig does not teach "obtaining processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate

a component on the frame" and "until the current position coincides with a hole in the frame through which the selected component may be attached to the frame and the tessellated representation of the selected component located at a current position does not interfere with the tessellated representation of any other component already configured to the frame."

The Office Action asserts that Koenig teaches "obtaining processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate a component on the frame." In support of the proposition that Koenig teaches this claim element, the Office Action cites Koenig at Col. 11, lines 38-44, stating that Figure 13 of Koenig shows the function and position of the pass-through beam and that "this teaching, in conjunction with the iterative process of Figure 2, depicts the inherent obtaining of a position, which would necessarily be a starting position, as other positions may be used in the modification process." Office Action at page 4. However, a careful review of the cited sections of Koenig indicate that it does not obtain processing data corresponding to each of the plurality of components to be mounted on the frame of a vehicle, as recited in Claim 1. The relevant section of Koenig states in its entirety the following:

> FIG. 12 illustrates the structure of the pass-through beam 122, while FIG. 13 shows the function and position of the pass-through beam 122 in combination with the package tray cross-member 124, the upper package tray 125, the lower package tray 127, the side roof rail 116, the rear shock tower 131 and the rear rail 133. The pass-through brace 122 provides torsional stiffness for the vehicle body.

[Koenig, Col 11, lines 38-44.] The cited sections of Koenig do not teach obtaining location information that corresponds to a logical starting position for attempting to locate a component on the frame. Instead, the cited sections of Koenig are directed to modeling a vehicle design in a

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computer system that has high rigidity in the vehicle body. The function and position of the pass-through beam, as disclosed in Koenig, is further described subsequently in the disclosure. In particular, Koenig states:

> The pass-through beam 122 is assembled to a mounting plate 121 which in turn is mounted to the rear shock tower 131. As shown in FIG. 13, the combination of the pass-through beam 122, package tray cross-member 124, side roof rail 116, mounting plate 121 and rear shock tower 131 mounted on the rear rail 133 provides a beneficial improvement over known designs. With this vehicle body, the weight and forces imposed on the side roof rail are taken up directly by the shock tower in the rear rail. This configuration provides high rigidity in this area and contributes to the overall torsional rigidity of the vehicle body.

[Koenig, Col. 11, lines 50-60.]

As the recited sections of Koenig indicate, the disclosure is directed to a vehicle design in which a pass-through beam is used to improve the structural integrity of the design over known systems. In particular, the vehicle design configuration depicted in Figures 12-13 of Koenig allegedly provide a vehicle design with a better overall torsional rigidity of the vehicle body than existing systems. Applicants are unable to find any disclosure in the cited reference of identifying location information corresponding to a logical starting position for attempting to locate a component on the frame, as recited in Claim 1. As mentioned previously, this recited claim element is directed to allowing users, such as users at a vehicle dealership, to identify each component that will be configured with a vehicle before processing to design the structural attributes of the vehicle are performed. Once these components have been identified, a logical starting position is identified and one or more attempts are made to locate each component on a frame. Providing a vehicle frame with higher torsional stiffness, as disclosed in Koenig, is simply not equivalent to this element recited in Claim 1.

The Office Action further asserts that Koenig teaches "until the current position coincides with a hole in the frame through which the selected component may be attached to the frame and the tessellated representation of the selected component located at a current position does not interfere with the tessellated representation of any other component already configured to the frame." In support of the proposition that Koenig teaches this claim element, the Office Action cites Koenig at Figures 2, 63, 68, and 70. See Office Action at page 5. In this regard, the Office Action states, "Koenig teaches many instances in which components are inserted into holes." Applicants submit that the Office Action mischaracterizes this recited claim element. The Office Action asserts that Koenig "teaches the reconfiguration of components if the model does not conform to the structural performance targets" as reading on the claim element of "until the current position coincides with a hole in the frame through which the selected component may be attached to the frame." Clearly, however, redesigning a vehicle frame that does not satisfy structural performance targets cannot reasonably be construed to be the functional equivalent of "determining whether the selected component at the current position coincides with the hole in the frame" until "the current position coincides with a hole in the frame through which the selected component may be attached to the frame."

As explained above, Koenig fails to teach or suggest a method for "obtaining processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate a component on the frame" and "determining whether the selected component at the current position coincides with a hole in the frame through which the selected component may be attached . . . until the current position coincides with a hole in the frame through which the selected component may be

attached to the frame." Accordingly, applicants respectfully request withdrawal of the pending rejection under 35 U.S.C. § 103(a) with regard to Claim 1.

Claims 2-8, 10, 13, and 15-16

Claims 2-8, 10, 13, and 15-16 depend from independent Claim 1. As discussed above, the cited references fail to teach each and every element of independent Claim 1 Thus, for the above-mentioned reasons, Claims 2-8, 10, 13, and 15-16 also recite allowable subject matter. Accordingly, applicants respectfully request withdrawal of the pending rejection under 35 U.S.C. § 103 with regard to Claims 2-8, 10, 13, and 15-16 and the allowance of Claims 2-8, 10, 13, and 15-16. Further, Claims 2-8, 10, 13, and 15-16 are non-obvious over the cited references for additional reasons, some of which are discussed in further detail below.

Claim 12

Claim 12 includes the additional element of "wherein the tree structure includes two or more sets of processing data for a selected component and wherein setting a next position in the range of additional positions defined in the processing data includes selecting a new set of processing data and obtaining a next position." As discussed above, multiple positions and logic may be used in attempting to locate a component on the frame. Claim 12 recites a particular way of identifying the appropriate processing data in performing multiple attempts in configuring a component to a vehicle frame. The Office Action cites Hill at Col. 1, lines 43-49, as reading on the aforementioned recitation of Claim 12. However, this section of Hill describes the use of a data structure for maintaining station data at particular assembly line stations when assembling a vehicle. Correlating station data as taught in Hill is not equivalent to using two or more sets of processing data as recited in Claim 12.

Independent Claim 17 reads as follows:

17. A computer system suitable and configured for generating frame designs for manufacturing a vehicle, the computer system comprising:

a processor that executes computer-executable instructions; and

a memory, the memory storing data and computer-executable modules comprising computer-executable instructions;

wherein, upon execution of one or more computer-executable module, the computer system is configure to:

obtain a specification for a plurality of components to be mounted on a frame of a vehicle,

obtain processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate a component on the frame, a range of additional dimensional positions to locate the component, and three-dimensional data corresponding to a tessellated representation of the component;

for each component of the plurality of components:

select the logical starting position as the current position for the selected component; and

repeatedly:

determine whether the selected component at the current position coincides with a hole in the frame through which the selected component may be attached to the frame, and further determine whether the tessellated representation of the selected component located at a current position interferes with the tessellated representation of any other component already configured to the frame; and

select a next position in the range of additional positions if the selected component fails to coincide with a hole through which the selected component may be attached to the frame, or if the tessellated representation of the selected component located at a current position interferes with the tessellated representation of any other component already configured to the frame;

until the current position coincides with a hole in the frame through which the selected component may be attached to the frame and the tessellated representation of the selected component located at a current position

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does not interfere with the tessellated representation of any other component already configured to the frame;

configure the selected component to the frame at the current position corresponding to a matching hole; and

generate a frame design corresponding to the configured positions for each of the plurality of components.

As can be seen, Claim 17 has been amended to recite similar elements to those found in Claim 1, particularly regarding "determining whether the selected component at the current position coincides with a hole in the frame through which the selected component may be attached ... until the current position coincides with a hole in the frame through which the selected component may be attached to the frame."

As set forth above with regard to Claim 1, Koenig, Hall, and Bowman, alone or in combination, fail to disclose each element of independent Claim 17. Accordingly, applicants request that the 35 U.S.C. § 103(a) rejection be withdrawn and this claim allowed.

Claims 18-24 and 27-32

Claims 18-24 and 27-32 each depend from independent Claim 17. As Claim 17 is in condition for allowance, applicants submit that Claims 18-24 and 27-32 are also in condition for allowance over the cited references. Accordingly, applicants respectfully request that the 35 U.S.C. § 103(a) rejection of these claims be withdrawn.

Claim 33

Independent Claim 33 reads as follows:

33. A computer-readable medium having computer-executable modules for generating frame designs for manufacturing a vehicle, the computer-executable modules comprising:

an interface module for obtaining a specification of a plurality of components to be mounted on a frame of a vehicle and for transmitting a frame

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design corresponding to a configuration of the components mounted on the frame of the vehicle;

a processing data module for storing processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data includes location information corresponding to a logical starting position for attempting to locate a component on the frame and a range of additional positions to locate the component and three-dimensional data corresponding to a tessellated representation of the component; and

a configuration module for obtaining the processing data corresponding to each of the plurality of components to be mounted on the frame and, after obtaining the processing data and for each of the plurality of components:

select the logical starting position of the current component as a current position for the current component;

repeatedly:

determine whether the current component at the current position coincides with a hole in the frame through which the current component may be attached to the frame, and further determine whether the tessellated representation of the current component located at a current position interferes with the tessellated representation of any other component already configured to the frame; and

select a next position in the range of additional positions if the current component fails to coincide with a hole through which the current component may be attached to the frame, or if the tessellated representation of the current component located at a current position interferes with the tessellated representation of any other component already configured to the frame;

until the current position coincides with a hole in the frame through which the current component may be attached to the frame and the tessellated representation of the current component located at a current position does not interfere with the tessellated representation of any other component already configured to the frame; and

configure the current component to the frame at the current position corresponding to a matching hole;

wherein upon execution of the executable modules on a computing device, configure the computing device to generate a frame design of a vehicle according to the configured positions of each of the plurality of components.

As discussed above, applicants respectfully submit that Koenig, Hall, and Bowman, alone or in combination, fail to disclose a configuration model configured as described above,

particularly one that selects a starting position as the current position and repeatedly determines if the current position coincides with a hole in the frame through which the component may be attached to the frame. Accordingly, applicants request that the 35 U.S.C. § 103(a) rejection of Claim 33 be withdrawn and the claim allowed.
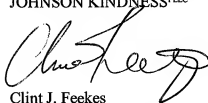
Claims 34-38 and 41-42

Claims 34-38 and 41-42 each depend from independent Claim 33. As Claim 33 is in condition for allowance, applicants submit that Claims 34-38 and 41-42 are also in condition for allowance over the cited references. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of these claims be withdrawn and the claims allowed.

<center>CONCLUSION</center>

In view of the amendments and the foregoing remarks, applicants submit that the pending claims are in condition for allowance over the cited references of Koenig, Hall, Bowman, and Hill. If the Examiner has any questions regarding the discussion provided above, the Examiner is invited to contact applicants' representative at the number below.

Respectfully submitted,

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